REMARKS

The examiner is thanked for a thorough examination of the present patent application.

Claims 1-16 are pending in the application with Claims 1, 8, and 15 as Independent Claims.

I.   CLAIM REJECTION UNDER 35 USC 103(a)

Claim 1 was rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (U.S. Patent No. 6,311,138) in view of Wiggers (U.S. Patent No. 5,397,981). The applicant respectfully traverses.

For a valid rejection under 35 U.S.C. 103(a), "[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness." MPEP 2142 (italic in the original; bold added). "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." MPEP 2143 (bold added), citing, inter alia, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The applicant respectfully submits that the Miller reference and the Wiggers reference, in any combination, do not render Claim 1 obvious. Claim 1 recites, inter alia, a step of "calculating bit period of the input signal by determining time period between the first zero space and the second zero space" where a zero space "is a period of time with no signal value (or data points) above certain threshold." Specification, paragraph [0004].

The Final Action admits that the "Miller [reference] does not explicitly teach **calculating bit period of the input signal by determining the time period between the first zero space and the second zero space.**" Final Action, paragraph 11 (bold in the original). However, the Final Action alleges that the "Wiggers [reference] teaches ... **calculating bit period of the input signal by determining the time period between the first zero space and the second zero space.**" Final Action, paragraph 12 (bold in the original). The Final Action asserts that this allegation is supported because, in the Wiggers reference, "amplitude value of each sample is compared to a reference threshold, and **three consecutive zero crossings** calculated[, t]hen the period is calculated as the time between the first and the third crossings." Id (bold added).

The applicant respectfully traverses and submits that the assertion of the Final Action is incorrect. Calculating bit period based on zero space is **not** equivalent to calculating bit period from "three consecutive zero crossings." This is because, for example, the two different approaches result in two different calculated bit periods for real world jittered and noise signals.

In the Wiggers reference, "the period of the signal [is] determined" by finding where "the amplitude of a signal crosses a horizontal reference line three times." Wiggers, col. 7, lines 16-18 and Wiggers, Figure 3.

In contrast, Claim 1 of the present invention determines the bit period by finding two consecutive zero spaces. Claim 1.

Figure A below shows noisy signal sample with sampled data points illustrating the differences. For the Signal S, a single waveform, sampled points are illustrated in small diamond data points. Under the Wiggers approach, "three consecutive zero crossings" are found as X1, X2, and X3 and the Wiggers' Bit Period X.

In contrast, in Claim 1, zero space patterns P1 and P2 are first found where a zero space "is a period of time with no signal value (or data points) above certain threshold." Specification, paragraph [0004]. Here, the Bit Pattern Z is calculated from the patterns P1 and P2. As illustrated, the Bit Pattern Z is different than and, in this case, more correct than, Bit Pattern X found under the Wiggers invention.
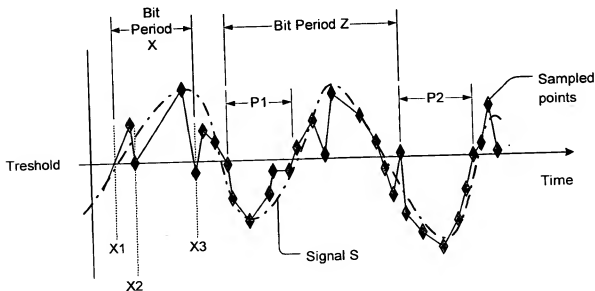
FIGURE   A

Figure B below shows noisy signal samples with sampled data points in multi-waveform graph for RZ signal, for example, in pseudorandom binary sequence (PRBS) multi-waveform signal. Here, under the Wiggers approach, "three consecutive zero crossings" are completely useless as its "zero crossings" X1, X2, and X3 are everywhere and results in useless Bit Period X.

In contrast, in Claim 1, zero space patterns P1 and P2 are first found where a zero space "is a period of time with no signal value (or data points) above certain threshold." Specification, paragraph [0004]. Here, the Bit Pattern Z is calculated from the patterns P1 and P2. As illustrated, the Bit Pattern Z is different than and, again in this case, more correct than, Bit Pattern X found under the Wiggers invention.
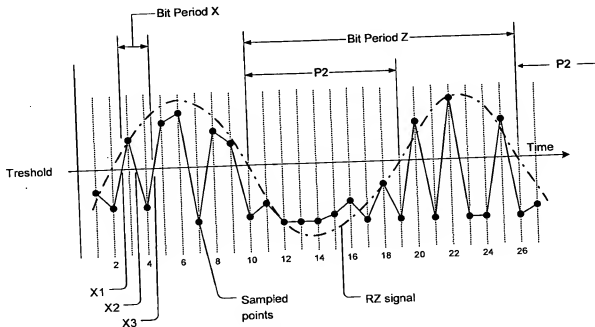
FIGURE   B

Consequently, the Miller reference and the Wiggers reference, in any combination, do not render Claim 1 obvious. This is because, as discussed, even when combined, the cited references fail to each the step of "calculating bit period of the input signal by determining time period between the first zero space and the second zero space" as recited in Claim 1. Thus, the references fail to meet the third requirement of the prime facie case of obviousness under MPEP 2143 and *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Accordingly, the applicant respectfully submits that Claim 1 is allowable over the cited references.

Dependent Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference and in further in view of Gauland et al. (U.S. Patent No. 6,571,185). The applicant respectfully traverses. Claim 2 depends on Claim 1. The applicant respectfully submits that Claim 2 is allowable for at least the same reasons for which Claim 1 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Dependent Claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over

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the Miller reference and in further in view of Norton (U.S. Patent No. 4,592,077). The applicant respectfully traverses. Claim 3 depends on Claim 1. The applicant respectfully submits that Claim 3 is allowable for at least the same reasons for which Claim 1 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Dependent Claims 4-7 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference in view of the Wiggers reference. The applicant respectfully traverses. Claims 4-7 depend, directly or ultimately, on Claim 1. The applicant respectfully submits that Claims 4-7 are allowable for at least the same reasons for which Claim 1 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Independent Claims 8 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference in view of the Wiggers reference. The applicant respectfully traverses. Although different in scope compared to Claim 1, Claims 8 and 15 recite similar limitations to Claim 1. Accordingly, the applicant respectfully submits that Claims 8 and 15 are allowable over the cited reference for at least the same reasons for which Claim 1 is allowable.

Dependent Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference and in further in view of the Gauland reference. The applicant respectfully traverses. Claim 9 depends on Claim 8. The applicant respectfully submits that Claim 9 is allowable for at least the same reasons for which Claim 8 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Dependent Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference and in further in view of the Norton reference.. The applicant respectfully traverses. Claim 10 depends on Claim 8. The applicant respectfully submits that Claim 10 is allowable for at least the same reasons for which Claim 8 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

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Dependent Claims 11-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference in view of the Wiggers reference. The applicant respectfully traverses. Claims 11-14 depend, directly or ultimately, on Claim 8. The applicant respectfully submits that Claims 11-14 are allowable for at least the same reasons for which Claim 8 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Dependent Claim 16 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Miller reference in view of the Wiggers reference. The applicant respectfully traverses. Claim 16 depends on Claim 15. The applicant respectfully submits that Claim 16 is allowable for at least the same reasons for which Claim 15 is allowable. See, e.g., *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

CONCLUSION

In view of the foregoing Remarks, the applicants respectfully submit that the entire application is in condition for allowance. The applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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